REMARKS

Reconsideration and allowance of this application are respectfully requested. Claims 1, 5 and 6 have been amended to improve clarity and precision. Claims 1-9 are pending in the application. Figure 1 has also been amended to add the label of --Prior Art--. The rejections are respectfully submitted to be obviated in view of the remarks presented herein.

Claim Objections

Claim 3 has been objected to as allegedly including variables not defined in the claim language. Applicant refers the Examiner to the language of the claim, which recites "wherein the output of the adder is limited to a fixed constant and below." The clear meaning of this recitation limits the output of the adder to not exceed the fixed constant. The term "below" solely designates the fixed constant to be an upper threshold. The use of the term "below" is thus believed to be proper.

Rejection Under 35 U.S.C. § 103(a)

Claims 1, 2, 5 and 6 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Murakami et al. (U.S. Patent Number 6,678,317 B1; hereinafter "Murakami") in view of Shiue et al. (U.S. Patent Number 5,612,873; "Shiue"). The rejection is respectfully traversed.

Regarding independent claim 1, the claimed invention relates to a digital signal receiver comprising an equalizing unit, an original signal decision unit, a carrier recovering and phase lock detecting unit, a re-rotator unit and a coefficients updating unit. The carrier recovering and

phase lock detecting unit outputs a phase lock signal when the phase is captured by a phase error detected between an input of the original signal decision unit and the decided original signal. The coefficients updating unit receives the phase lock signal from the carrier recovering and phase lock detecting unit and a restored signal from the re-rotator unit, generates an error for updating coefficients of the equalizing unit, and updating the coefficients of the equalizing unit.

Turning to the cited art, Murakami describes an adaptive equalizer device as shown in Figure 8 and further shown in component detail in Figures 3, 4, 11 and 17. Murakami's adaptive equalizer device comprises an adaptive equalizer (4a) with CMA algorithm circuit (17) and DD algorithm circuit (18), a carrier frequency error detecting circuit (5) with output decision result estimating circuit (10), rotation detecting circuit (19) and carrier frequency error removing circuit (3). The adaptive equalizer (4a) selects one of the algorithm circuits (17 and 18) for use in removing intersymbol interference.

Examiner maintains that the combination of Murakami and Shiue teaches each feature of the claimed invention. However, Murakami does not at all mention a phase lock signal, nor does Murakami mention a re-rotator unit. In addition, the Examiner readily admits that Murakami does not provide a phase lock signal. Murakami's adaptive equalizer (4a) selects either the CMA algorithm circuit (17) or the DD algorithm circuit (18) to perform filtering on a signal. Selection is made based on α and β flag signals which are set as a result of detected rotation of an output signal made by rotation detecting circuit (19). However, Murakami does not generate a phase lock signal for output from a carrier recovering and phase lock detecting unit, and which is further output to a coefficients updating unit. Murakami's rotation detecting circuitry (19)

performs neither carrier recovery not phase lock detection, but only detects a correlation error to set the flag to α when the carrier frequency error exceeds a given value, otherwise the flag is set to β. Carrier frequency error detecting circuit (5) estimates an output decision result by outputting a desired signal based on a rotation angle. The output from the carrier frequency error detecting circuit (5) is also not a phase lock signal.

Shiue does not remedy the deficiencies of Murakami. Shiue teaches a multi-mode equalizer for convergence of ghost signals. The equalizer comprises a decision feedback equalizer (30), adder (24), de-rotator (36), slicer (40), carrier recovery network (46), switch (42), bypass MUX (44), re-rotator (50) and control signal generator (26). However, there is also no teaching in Shiue of at least a phase lock signal output from a carrier recovering and phase lock detecting unit, and receiving the phase lock signal at a coefficients updating unit. Even if the control signal output from the switch (42) is assumed to be a phase lock signal, the signal is not received at a coefficients updating unit of decision feedback equalizer (30). The control signal from switch (42) controls the bypass MUX (44) to switch which signals are input to re-rotator (50) and decision feedback equalizer (30), and does not control the operation of the decision feedback equalizer (30) itself. In contrast, the claimed invention changes the operation of the equalizing unit such that functionality of the equalizing unit is changed, not just changing the type of inputs the equalizer receives, as taught by Shiue. At least by virtue of the aforementioned differences, the invention defined by claim 1 is patentable over Murakami in view of Shiue. Claims 2, 5 and 6 are dependent claims including all of the limitations of independent claim 1, which, as established above, distinguishes over Murakami in view of Shiue.

Therefore, claims 2, 5 and 6 are patentably distinguished over Murakami in view of Shiue for at least the aforementioned reasons as well as for their additionally recited features.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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